Forest Health Technology
ENTERPRISE TEAM UPDATE

PUBLISHED BY THE USDA FOREST SERVICE FOREST HEALTH TECHNOLOGY ENTERPRISE TEAM

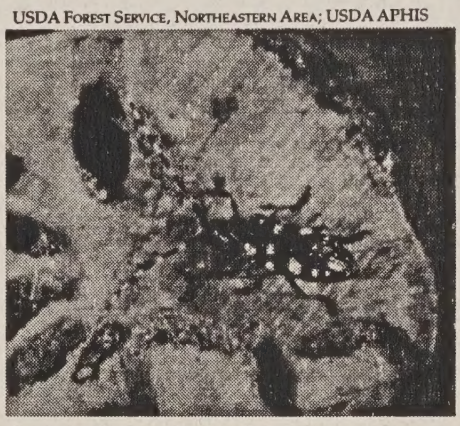
SPRING 1998

Asian hitchhiker threatens trees in North America

A wood-boring immigrant with an appetite for hardwood trees is causing consternation in some northeastern U.S. cities. The inch-long, shiny, coal-black beetles with white spots and long black-and-white antennae were noticed infesting trees in August 1996, in Brooklyn, NY. Entomologists identified these exotic-looking creatures as an Asian species of longhorned beetle (Coleoptera: *Cermabycidae*). The Asian longhorned beetle (ALHB), *Anoplophora glabripennis* Motschulsky, is native to China, Taiwan, Japan, and the Malaysian peninsula, so it truly is exotic in the U.S. In addition to the Brooklyn infestation, a related infestation was found in Amityville on Long Island.

This wood borer is believed to have hitchhiked into the U.S. in wood used for crating of cargo which was imported in the early 1990s. In the few years they have been in New York, the beetles have heavily attacked maple (*Acer*) species, including Norway, red, sugar, silver, boxelder, and

USDA FOREST SERVICE, NORTHEASTERN AREA; USDA APHIS



Asian longhorned beetle adult. This exotic woodboring beetle is a potential danger to North American hardwoods

sycamore, as well as horsechestnut (*Aesculus*); and birch (*Betula*). The insect has the potential to be extremely damaging to hardwoods in the commercial, urban, and other

See **Hitchhiker**, page 4

When Irish guys are flying

It wasn't quite a morn in spring, but the air was clear and it was a good day for flying when members of the Enterprise Team-Fort Collins and the Remote Sensing Application Center (RSAC) took two visitors from Ireland on a test flight of the color infrared digital camera system early in March. Philip McGinnity, of the Farran Laboratory at the Salmon Research Agency of Ireland, and Gearóid Ó Riain, a biologist with Trinity College in Dublin, were in Fort Collins to gain hands-on experience with the digital camera system. Ó Riain had been corresponding with the Enterprise Team and RSAC for the past few years on the use of airborne video and digital camera technologies for natural resource applications. Ó Riain and McGinnity are interested in using the color infrared digital camera technology for monitoring riparian and coastal areas used by Atlantic salmon. The tests performed in Fort Collins

USDA FOREST SERVICE, FOREST HEALTH TECHNOLOGY ENTERPRISE TEAM

Philip McGinnity, left, and Gearóid Ó Riain, right, after test flight of color infrared digital camera system.

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Inside . . .

Team Working as a Team

TeamWork: Working as a Team *is an ongoing column dealing with the nuts-and-bolts problems of getting work done in an enterprise team. We will share some of our successes and point out some of the pitfalls we encounter as the Enterprise Team moves with the Forest Service into the 21st century.*

Team welcomes guest conductors

For the past several months, the Enterprise Team-Fort Collins, like an orchestra whose season features guest conductors, has been led by a series of leaders, each with a unique style and interpretation of the score. As professionals, we have played our parts, following the baton of each maestro to produce a harmonious result. Acting directors who have filled the leadership role in recent months are Melvyn J. Weiss, Jerome S. Beatty, and Jesus A. Cota. As we go to press, we are preparing to welcome Borys Tkacz, Arizona Zone Leader for the Southwestern Region, Forestry and Forest Health, as our next guest conductor.

Each director brings unique strengths to the task of conducting. The *Update* interviewed Weiss, Beatty, and Cota for impressions of how it feels to be an "acting" leader and for input on how well the Enterprise Team is using its team structure to meet its goals and fulfill its mission.

Melvyn J. Weiss, our conductor during October 1997, is Deputy Director of the Washington Office Forest Health Protection staff. His area of expertise is national program management and pathology; he served as Regional Pathologist in the Southwestern Region, Zone Pathologist and Staff Pathologist in the Southern Region, and Field Representative in the Northeastern Area before coming to Washington in 1988.

> **"The Team has impressive skills and is doing outstanding work that will benefit Forest Service Regions, States, and our other clients."**
>
> **Melvin J. Weiss**

Weiss said of his time with the Enterprise Team, "Most of all I appreciated the opportunity to become better acquainted with the members of the staff and their work. [The Team] has impressive skills and is doing outstanding work that will benefit Forest Service Regions, States, and our other clients."

As for the disadvantages of directing a group of comparative strangers, he commented, "As occurs with 'acting' assignments, I experienced times of uncertainty as to what were the most important things to do and how I could be most effective." Weiss said he regretted not having more time to understand how the team structure works. "I suppose 'Team' comes in different flavors and has different meanings for different people and situations. For me, it means people working together in a focused way toward clearly defined goals, and by this definition I think the Enterprise Team is progressing well."

He called the experience a "refreshing change" from his usual duties and thanked team members, especially Margaret Means and Sally Scrivner, USDA Forest Service, and J.D. Mullen, Autometric Service Company, for their contributions to his work with the Team.

See Guest conductors, page 3

ENTERPRISE TEAM UPDATE

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Guest conductors, from page 2

Jerome S. Beatty had worked as a cooperator with the Enterprise Team and Methods Applications Group (MAG), one of the Team's predecessor groups, before serving as acting director of the Enterprise Team-Fort Collins in late 1997. As an active cooperator in projects with MAG, he was already familiar with the Team's work. He came to us with the goal of increasing his contacts with workers in the field, getting a better feel for the challenges and problems of field personnel, and for learning about how the Enterprise Team works with field units.

Being an acting director, says Beatty, is a sort of "virtual reality"

> **"The Team concept is alive and well in both theory and practice at the Enterprise Team."**
>
> **Jerome S. Beatty**

approach to leadership. Ideally, an "acting" assignment fuses benefits for the detailer and benefits for the group. The detailer has time to speak informally with people about their projects, an opportunity to observe the Team's operations, a chance to compare and contrast different ways of accomplishing leadership goals, and the luxury of "daydreaming" about how one might accomplish these goals oneself.

For Beatty, a unique benefit of guest conducting the Enterprise Team was the opportunity to work with a mix of Forest Service personnel and on-site contractors. Working with so many "outsiders" gives one a good dose of reality. Because of the worker mix, issues are discussed from many perspectives.

Beatty observed that the Enterprise Team is both project-oriented and, through coordination meetings and day-to-day contact, oriented toward the Team's larger mission. "The team concept is alive and well in both theory and practice at the Enterprise Team."

For Jesus A. Cota, being acting director for Enterprise Team-Fort Collins was "a great learning experience." He enjoyed both administrative tasks and learning more about technical projects.

Cota served as acting director from late January to mid-March 1998. An agricultural entomologist by training, he joined the Forest Service in 1980, supporting pest management in state and private forests in the Northeast. An expert on pesticides with a strong integrated pest management background, he develops policy as well as providing staff with technical direction in the use of pesticides. Cota noted the contrast between his usual responsibilities as an enforcer of pesticide use regulations and his Enterprise Team responsibility to emphasize meeting customers' needs and helping to solve their problems.

The advantage of serving in an "acting" position, for Cota, is the opportunity to try different things and see a different kind of organization. A disadvantage is lack of continuity. An acting director has less direct accountability than a permanent one, so it is more difficult to be taken seriously. But, because the position is short-term, cooperation for short-term objectives may be easier.

> **"I felt accepted as part of the Team and want each member to know I appreciate that."**
>
> **Jesus A. Cota**

Cota values the Team's focus on developing projects for and with the help of the end users. Being able to work with products which are actually wanted rather than products which "we <u>think</u> people want" is a plus.

Cota expressed thanks to support staff, contractors, and federal staff for having "a warm and willing nature and a cooperative spirit. I felt accepted as a part of the Team and want each member to know I appreciate that. I gained both professionally and personally."

Our entire organization has gained from our time with these talented leaders. We appreciate their input, efforts, and expertise.

—Shirley Wilsey
Autometric Service Company

Irish, from page 1

confirmed their expectations that the system will allow them to monitor, not only stream channel and bank width, but also sedimentation and other conditions. Dave Linden, INTECS International contractor with the Enterprise Team, will assist the biologists in implementing camera technology in Ireland in the near future.

—Jeanine Paschke
INTECS, International

Hitchhiker, from page 1

forests of North America, as it attacks not only stressed or aging trees, but also healthy trees of any age. It is believed that ALHB adults do not disperse widely; nevertheless, populations can build rapidly, increasing 10 to 20 times each year.

In response to this threat, the USDA Animal and Plant Health Inspection Service (APHIS) requested the formation of a panel of scientists from various government agencies and universities to recommend ways to eradicate ALHB from New York and to identify research needs. Richard Reardon of the Enterprise Team-Morgantown and coauthor Vic Mastro of APHIS are members of the ALHB Science Panel.

The Science Panel, in cooperation with the USDA Forest Service, APHIS, the Agricultural Research Service (ARS), and scientists at Cornell and Syracuse universities, is developing technology to manage ALHB. The specific objectives of this effort are:

- To develop survey techniques based on kairmones (volatile chemicals emitted by one species to affect another species) and hormones from both male and female adult ALHB beetles
- To develop control techniques to prevent egg laying or to eliminate beetles from infested trees (e.g., systemic insecticides)
- To determine which North American tree species are suitable for ALHB larval development and adult maturation feeding
- To develop technical support for the exclusion and eradication programs
- To perform a risk assessment for possible introductions associated

See **Hitchhiker**, page 9

On the lookout for the longhorn beetle

Adult Asian longhorned beetles are about one-inch long, with nearly as long black-with-white, ringed antennae. Bodies are shiny and coal black, with white spots on the wing covers (See Photo 1).

USDA FOREST SERVICE, NA; USDA APHIS

Photo 1. Adult Asian longhorned beetle and larval tunnels

Little information concerning the Asian longhorned beetle is available in English. Translation of some references in Chinese provided the following facts:

1. Adults are active from May through early October and feed on tender bark, twigs, and leaves of maple, elms (*Ulmus*), poplars (*Populus*), and willows (*Salix*)
2. Adults usually move only about 300 meters per season; they live 78-98 days
3. Adult females cut slits in the bark with their mouthparts and lay from 30 to 50 eggs per female
4. The appearance of the slits depends on the thickness of the bark of the tree being attacked
5. When eggs hatch, young larvae bore first into the inner bark and later into the tree's heartwood (See Photo 2). These larval galleries interrupt the flow of water from the roots to the leaves
6. Pupation usually occurs in the spring of the second year
7. Adult beetles chew their way to the bark surface, leaving three-eighths-inch, round holes (See Photo 3) and lots of heavy, coarse wood fibers on the ground
8. The larval activity in the cambium can effectively girdle branches or small trunks. Larval feeding in the wood structurally weakens the tree, and the gallaries open the tree to attack by other organisms
9. Adult beetles tend to colonize a tree, first attacking the upper portions and then working downward, even to the root collar, until the tree eventually dies

USDA FOREST SERVICE, NA; USDA APHIS

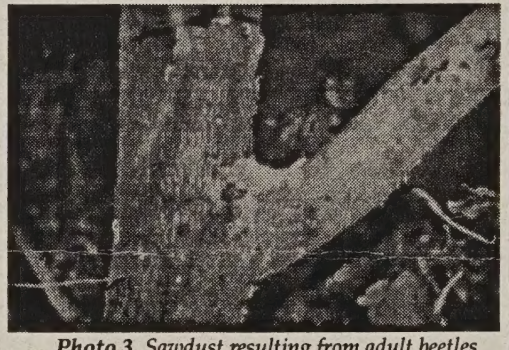

Photo 3. Sawdust resulting from adult beetles chewing their way out from inside the tree

USDA FOREST SERVICE, NA; USDA APHIS

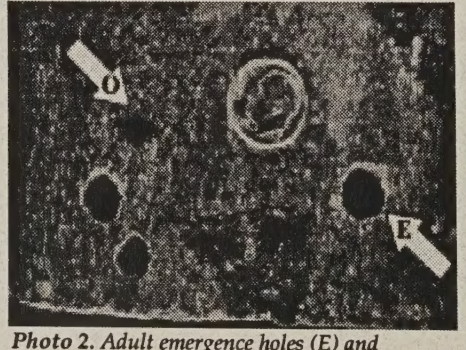

Photo 2. Adult emergence holes (E) and oviposition sites (O) on Norway maple

Recent Publications

Spring 1998

To order copies of Enterprise Team publications listed here, see the order form on the reverse of this page.

FHTET 98-03 Teske, Milton E. 1998. FSCBG implementation into SpraySafe Manager: An update toward version 1.0. FHTET 98-03. (C.D.I. Technical Note No. 97-07, dated July 1997, prepared under Contract No. 53-0343-1-00153, with technical oversight by Harold Thistle, Missoula Technology and Development Center). Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 71 p.

Abstract

This report summarizes the continuing development of a highly user-friendly, personal-computer-based, program called SpraySafe Manager, a decision support system developed in cooperation by the USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team and the New Zealand Forest Research Institute. It uses as its computational engine the near-wake aerial application prediction model AGDISP, found in The Forest Service Cramer-Barry-Grim (FSCBG) aerial application prediction model. In its second phase of development toward the release of Version 1.0, SpraySafe Manager has been refined with the latest computational improvements (developed in other applications of the computational engine), enhanced by the addition of new features, and augmented by an expanding database for aircraft, nozzles, and dose-response for herbicides. The "beta" version of SpraySafe Manager predicts the deposition of spray material within the swath of the aircraft and spray material drift downwind, toward and into potentially sensitive (nontarget) areas. Current options in SpraySafe Manager enable the user to visualize the ground deposition (from one flight line or over the entire spray block), estimate the environmental fate of all released active spray material, compute the safe distance to a sensitive species, estimate the application effectiveness within the spray block, approximate the productivity of the spray operation, and examine the sensitivity of results to changes in aircraft and environmental conditions.

FHTET 98-04 Teske, Milton E. 1998. FSCBG Model Sensitivity Predictions of Spray Boom Length. FHTET 98-04. (C.D.I. Technical Note No. 97-08, dated July 1997, prepared under Contract No. 53-0343-1-00153, with technical oversight by Harold Thistle, Missoula Technology and Development Center). Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 32 p.

Abstract

The near-wake portion of the USDA Forest Service aerial application prediction model Forest Service Cramer-Barry-Grim (FSCBG) is applied to a sensitivity study of the length of the spray boom relative to the length of the aircraft semi-span or rotor radius. Building on extensive previous work, this study examines the predictions by the near-wake Lagrangian trajectory model of swath width, mean deposition within the spray block, and drift fraction downwind of the spray block. Six aircraft and the four British Crop Protection Council droplet size distributions were used in simulating a specific agricultural application scenario. Findings from this study indicate the effects of varying boom length on downwind drift, the reduction of downwind drift with larger droplets, and the ability of certain aircraft to reduce downwind drift more easily than others. These results support the suggestion that boom lengths be no longer than 75 percent of the semi-span or rotor radius, and may, in some situations, indicate the need to reduce them further, depending on the droplet size distribution anticipated from the nozzle.

FHTET 98-05 Teske, Milton E. 1998. FSCBG model sensitivity results applied to application parameter estimation. FHTET 98-05. (C.D.I. Technical Note No. 97-13, dated July 1997, prepared under Contract No. 53-0343-1-00153, with technical oversight by Harold Thistle, Missoula Technology and Development Center). Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 59 p.

Abstract

A recently-completed sensitivity study of the near-wake portion of the USDA Forest Service aerial application prediction model Forest Service Cramer-Barry-Grim (FSCBG) forms the basis for two further investigations: (1) the applicability of the results fashioned in to a Training Module for developing decision support systems; and (2) the usefulness of the results as a means of testing known deposition patterns and inferring the conditions under which the aerial application occurred. The first area of attention is fairly straightforward; it requires a rational application of an extensive database generated by the appropriately constructed sensitivity study. The second area of attention is far more complicated and requires greater depth and detail of model calculations, particularly in placing limits on the approach well before the proposed technique is applied. Results from this study suggest that the tools are clearly in hand to develop a Training Module for the model, or for any of the decision support systems FSCBG is a part of, since only trends in data are needed for that purpose. However, a forensic approach to deposition patterns demands more extensive and more detailed data structures. Application parameter estimation may, in fact, best be achieved by trial-and-error model calculations around an approximately correct input dataset.

This study demonstrates that the simulation of the aerial application of spray material is far too complicated to reduce to a few simple, easy-to-interpret algebraic expressions. The non-uniqueness of the problem is found in the minute details of the predicted downwind deposition pattern (many input combinations lead to similar deposition patterns). To find the one set of inputs that gives an exact match requires a meticulous investigation that may have little chance of success, because of the number of inputs. Beginning with an answer and tracking back to the initial application parameters leads to many different possible combinations.

Recent Publications, continued

FHTET 98-06 Teske, Milton E. 1998. Lagrangian techniques in the modeling of the aerial application of pesticides. FHTET 98-06. (C.D.I. Technical Memorandum No. 97-28, dated November 1997, with technical oversight by Harold Thistle, Missoula Technology and Development Center). Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 12 p.

Abstract

This memorandum summarizes the several computer software products developed from the approach of following the trajectories of released spray material by a Lagrangian technique. The models include: AGDISP, Forest Service Cramer-Barry-Grim (FSCBG), Swath Kit, SpraySafe Manager, the Spray Advisor module of Gypsy Moth Expert System (GypsES), and AgDRIFT.

FHTET 98-07 Teske, Milton E. 1998. FSCBG tasking: A white paper summary. FHTET 98-07. (C.D.I. Technical Memorandum No. 97-06, dated April 1997, with technical oversight by Harold Thistle, Missoula Technology and Development Center). Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 10 p.

Abstract

This memorandum lists tasks suggested, supported, and explored in connection with the transfer of supervision of Forest Service Cramer Barry Grim (FSCBG), an aerial application prediction model developed in part by Jack Barry, from the Davis, CA office of the Forest Health Technology Enterprise Team, of which Barry was director, to Harold Thistle of the Missoula Technology and Development Center, Missoula, MT. This list represents the possibilities of current FSCBG technology. The tasks are a natural progression in the direction the program has taken in the last few years. If this direction continues, several of these tasks should be identified, funded, and undertaken. If the direction changes, these tasks may be used as a springboard to broader issues that may need addressing. The Forest Service contract with Continuum Dynamics, Inc., carries a completion date of 30 September 1998. Funding for Fiscal Year 1998 and the future may be shaped in part by these suggested areas of further model development.

FHTET 98-08 Rosenberger, Randall S.; Smith, Eric L. 1998. Assessing forest scenic beauty impacts of insects and management. FHTET 98-08. Fort Collins, CO: USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team. 39 p.

Abstract

Natural disturbances, such as fire, insects, diseases, and severe weather, can affect the perceived scenic beauty of forest landscapes. The impacts of disturbances may be reduced through management actions, although it is difficult to determine an appropriate level of mitigation. A better understanding of how the beauty of forests is affected by disturbance would enable more effective and efficient management of them; hence, this assessment of the scientific knowledge concerning the impacts of forest insects on scenic beauty. This assessment defines management implications, including the degree to which forest insect impacts on scenic beauty may be partially mitigated through prevention of outbreaks, control of outbreaks, or other indirect methods, such as stand and slash treatment.

The paper discusses relationships between scenic beauty perceptions and certain forest characteristics, such as the presence and dominance of large trees, tree species composition, and stand age. Stand treatments, such as burning, harvesting, treating slash, and regenerating harvested stands, also affect scenic beauty. Stand treatment impacts on scenic beauty may be relatively large, compared to the impacts caused by insects. A summary of scenic beauty estimation studies concerning forested landscapes is presented in tabular form as an appendix. This review is restricted to studies conducted on forests located in the U.S. about the perceptions of U.S. residents. Significant cultural differences may reduce the transferability of the studies' results to forests in other countries.

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ENTERPRISE TEAM UPDATE

Forest Health Technology Enterprise Team Update

1998 Readers' Comment Form

In order to assist us in planning future format and content of the *Enterprise Team Update*, we would appreciate your completing and returning this comment form. Thank you for taking the time to help us out. Please respond by May 31, 1998.

1. What I like most about the *Enterprise Team Update*:

2. What I like least about the *Enterprise Team Update*:

3. I would like to see more articles/information about:

4. If I were in charge of the *Enterprise Team Update*, these are the changes I would make:

5. I find that the *Enterprise Team Update* provides information that is useful and informative. (Circle one)

Strongly agree Agree Disagree Strongly disagree No opinion

6. I work for: (Circle any that apply)

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7. My primary work is in: (Circle all that apply)

Aerial Application of Pesticides
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Ecological Modeling
Forest Ecology
Data Visualization
Geographic Information Systems
Insect Impact Assessment
Long-Term Cumulative Effects Management
Nontarget Effects
Remote Sensing
Statistical Analysis
Team Approaches to Technology Development
Technology Program Management
Valuation of Natural Resources
Other

8. Additional comments or suggestions regarding the *Enterprise Team Update* that you feel would be helpful to us in conducting our review:

Team takes on service project

The Enterprise Team is gearing up to take on the challenge of re-engineering and porting a significant Forest Service information system. The Research Budget and Attainment Information System (RBAIS) will be relocated to the IBM platform by the end of 1998. RBAIS is used by the Research and Development Deputy Area to manage and track all information needed for the development and execution of the current and out-year budgets. It is also designed to create needed reports submitted to Congress. Additionally, it tracks and manages all information necessary for the production of the annual attainment report.

The primary users of this system are Station Assistant Directors, program managers, project leaders, Washington Office staff, and Station Directors. The main focus is on information for Research Planning and Applications. The goal is to have the information entered once on the IBM platform and used or accessible by all who need it. The information will be maintained to ensure it is accurate, current, and delivered in the required format.

This project represents quite a challenge to the Enterprise Team staff. The opportunity to work with Research and Development on this task will be a positive learning and strengthening experience for us.

—Judy Adams
USDA Forest Service

Hitchhiker, from page 4

with wood, such as crating, pallets, and dunnage, originating from areas where the insect is native

The Forest Service, through Enterprise Team-Morgantown, and APHIS, through the Otis Methods Center, have initiated a three-year cooperative agreement with the Chinese Academy of Forestry and Beijing Forestry University to:

- Evaluate insecticides used as cover sprays and systemics to prevent oviposition or to eliminate beetles from infected trees
- Identify an effective attractant (kairmone/pheromone) and trap for surveying adult beetles
- Produce a bibliography and information database on ALHB

Boade Wang of the Otis Methods Center and Yun Wu of Enterprise Team-Morgantown traveled to China in March 1998 to establish study plots and exchange information about the need for additional laboratory and field studies.

In China, one hundred and seven species of longhorned beetles injure poplar, maple, and willow species, and more than ten of these cause large-scale economic injuries. ALHB is distributed throughout China, attacking both weakened and healthy trees. Limited mechanical and insecticidal controls are used only on young individual trees. Since ALHB has a wide range of hosts and forest trees are generally too tall to implement controls, ALHB has become one of the most difficult-to-control forest pests in China. The control of ALHB will be a gradual process; it will require regulating the movement of trees and their products, employing silvicultural methods (e.g., planting a mixture of tree species), and planting resistant varieties of trees.

In the U.S., the only survey technique available is dependent on visual inspection. This method is both expensive and ineffective for detecting lightly infested trees. The eradication program relies on the removal and destruction of all infected host material. This includes removal of trees with any evidence of infestation, such as oviposition sites or adult exit holes. The whole tree is removed, and all material is chipped and burned. Stumps are then removed by grinding. To date, approximately 450 trees have been removed, chipped, and incinerated in Amityville. In Brooklyn, 361 trees have been removed from street and public parks; another 280 trees are being removed from private property. Surveys throughout Long Island and adjacent areas in New York, New Jersey, and Connecticut are continuing.

—Richard Reardon, USDA Forest Service
—Vic Mastro, USDA APHIS
—Yun Wu, Michigan Tech

Forest Health Protection announces Special Technology funding

Forest Health Protection (FHP) annually awards funding for proposals submitted under the Special Technology Development Program (STDP). This program facilitates the development and transfer of technology applications that contribute to efficient FHP field operations. In fiscal year 1998, a total of $1,278,000 is being allocated to a total of 31 new and continuing projects.

Twenty-six of the projects funded are continuing; approximately $1 million has been allocated to completing their important work. Because of large financial commitments to outstanding continuing projects, less than a quarter of the available funding could be allocated to new projects. Of twenty-three proposals for new projects, six received funding. Proposals were evaluated as to their responsiveness to current Forest Health technology needs, their description of the most technically sound methods, and their likelihood of success.

Vegetation Management and Protection Research (VMPR) participates in the program to accelerate development of technologies through collaboration between research scientists and field personnel managing forest health protection programs. Matching funds from VMPR and FHP totalling about $400,000 annually is allocated to projects that improve the Forest Service's ability to protect resources threatened by non-indigenous pests. Thirteen of the funded projects are included in this category.

Project leaders manage the funds and supplement them when possible with contributions from cooperating staffs. Over $1 million are being contributed by cooperators working with field project teams this year. With almost half of the costs covered by contributions to the original funding provided by FHP and VMPR, we are confident that many people consider this a valuable program.

The Pest-Trend Impact Plot System (PTIPS) is a major continuing program funded through Special Technology Development Projects. Enclosures with the official final funding letter dated March 11, 1998, indicate PTIPS projects are continuing in seven Forest Service Regions: Northern, Rocky Mountain, Southwestern, Intermountain, Pacific Southwest, Pacific Northwest, and Alaska. The Intermountain Region provides project management across these Regions. Borys Tkacz, Arizona Zone Leader, Region 3, Albuquerque, NM, leads the PTIPS project.

Projects other than PTIPS projects are listed below, organized by Forest Service Region. Projects marked with an asterisk (*) are funded by FY 1998 Technology Development Program Supporting Management of Non-Indigenous Pests. Project contact persons are listed in parentheses after each item.

Northern Region

R1-1997-01. Comparison of anti-attractant placement to control pine engravers (Ken Gibson, USDA Forest Service, Forest Health Protection, Missoula, MT)

*R1-1997-02. Insects as agents for control of spotted knapweed (Nancy Campbell, USDA Forest Service, Forest Health Protection, Missoula Field Office, Missoula, MT and Sandy Kegley, USDA Forest Service, Forest Health Protection, Coeur d'Alene Field Office, Coeur d'Alene, ID)

*R1-1997-03. Biocontrol agents of yellow starthistle (Carol Bell Randall, USDA Forest Service, Region 1, Coeur d'Alene Field Office, Coeur d'Alene, ID)

Rocky Mountain Region

R2-1995-01. GIS-based root disease risk rate (Jeri Lyn Harris, USDA Forest Service, Rapid City Service Center, Region 2, Forest Health Management, Rapid City, SD)

R2-1997-01. Western balsam bark beetle and subalpine fir decline (Tom Eager, USDA Forest Service, Forest Health Protection, Gunnison Service Center, Gunnison, CO)

R2-1998-01. Alternatives to Methyl Bromide Fumigation (Jeri Lyn Harris, USDA Forest Service, Rapid City Service Center, Region 2, Forest Health Management, Rapid City, SD)

Southwestern Region

R3-94-02. Hazard rating western spruce budworm (Ann Lynch, USDA Forest Service, Rocky Mountain Research Station, Flagstaff, AZ)

R3-94-03. Site and stand factors associated with roundheaded pine beetle (Terry Rogers, USDA Forest Service, Region 3, Forest Health Protection, Albuquerque, NM and Jill Wilson, USDA Forest Service, Region 3, Forest Health Protection, Flagstaff, AZ)

See **STDP funding**, page 11

STDP funding from page 10

R3-95-01. Mountain pine beetle risk rating in the Southwest (Jill Wilson, USDA Forest Service, Region 3, Forest Health Protection, Flagstaff, AZ)

*R3-1997-01. Hazard rating white pine blister rust in the Southwest (Dave Conklin, USDA Forest Service, Southwestern Region, Forest Health Pest Management, New Mexico Zone Office, Albuquerque, NM)

Intermountain Region

*R4-1997-02. Biological control of leafy spurge (Tom Barbouletos, USDA Forest Service, Region 4, Forest Health Protection, Boise Field Office, Boise ID)

R4-1997-03. Predicting spruce beetle populations (Steve Munson, Region 4, Forest Health Protection, Ogden Field Office, Ogden, UT)

Pacific Southwest Region

R5-97-01. Verbenone and ipsdienol circular and grid pattern deployment (Sheri Smith, USDA Forest Service, Region 5, Forest Pest Management, Northeastern California Shared Service Area, Susanville, CA)

R5-97-02. Thinning to limit Jeffrey pine beetle impact (Sheri Smith, USDA Forest Service, Region 5, Forest Pest Management, Northeastern California Shared Service Area, Susanville, CA, and Steve Munson, USDA Forest Service, Region 5, Ogden Field Office, Ogden, UT)

*R5-1998-02. Develop application and evaluation technology for four biological controls for weeds in Hawaiian forests (Duane Nelson, Forest Health Coordinator, USDA Forest Service, Institute of Pacific Island Forestry, Hilo, HI)

Pacific Northwest Region

R6-93-01. Methyl bromide alternatives (Diane Hildebrand, USDA Forest Service, Region 6, Forest Insects and Disease, Portland, OR)

R6-94-05. Streamline western spruce budworm model (Katharine A. Sheehan, USDA Forest Service, Region 6, Forest Health Protection, Portland, OR)

R6-95-01. Effects of thinning in Douglas-fir (Jerome S. Beatty, USDA Forest Service, Region 6, Westside Technical Center, Sandy, OR)

R6-95-02. Risk/thin guidelines, black stain root disease management (Dr. Donald Goheen, USDA Forest Service, Southwest Oregon Forest Insect and Disease Technical Center, Medford, OR)

*R6-97-01. *Phytophthora lateralis* resistance development in Port-Orford cedar (Dr. Donald Goheen and Katy Marshall, USDA Forest Service, Southwest Oregon Forest Insect and Disease Technical Center, Medford, OR)

R6-97-02. Prescribed burning to minimize black stain in ponderosa pine (Craig Schmitt, USDA Forest Service, Forest Sciences Laboratory, LaGrande, OR)

R6-97-03. Pheromone-based management of Douglas-fir beetle at landscape level (Dave Bridgewater, USDA Forest Service, Region 6, Forest Health Protection, Portland, OR)

Southern Region

R8-1998-01. Control methods and guidelines for hemlock woolly adelgid (James R. Rhea, USDA Forest Service, Forest Health Protection, Asheville, NC)

R8-97-01. Minimizing seedling loss from pitch canker in longleaf and shortleaf pine ecosystem restoration (Steve Oak, Southern Region Forest Health Protection, Asheville Field Office, Asheville, NC)

R8-97-02. Refine methods for suppression of southern pine beetle using verbenone (Stephen Clark, USDA Forest Service, Region 8, Forest Health Protection, Lufkin, TX)

R8-97-03. Evaluation of imidacloprid (Alex Magini, USDA Forest Service, Region 8, Forest Health Protection, Pineville Field Office, Pineville, LA)

R8-94-03. Evaluation of native biological controls for the hemlock woolly adelgid (James H. Rhea, USDA Forest Service, Region 8, Forest Health Protection, Asheville Field Office, Asheville, NC)

*R8-1998-04. Enhancement of GypsES for use in management of other pests and gypsy moth in the West (John Ghent, USDA Forest Service, Region 8 Forest Health Protection, Asheville Field Office, Asheville, NC)

Northeastern Area

*NA-1997-01. Biological control of hemlock woolly adelgid on eastern hemlocks and Fraser fir (Dennis Souto, USDA Forest Service, Northeastern Area, Durham Field Office, Durham, NH)

*NA-1997-02. Decision support considering effects of *Entomophaga maimaiga* on gypsy moth (Michael Connor, Northeastern Area, Forest Health Protection, St. Paul, MN)

*NA-1998-01. Develop rearing techniques and evaluate alternative food sources of *Pseudoscymnus*, predator of hemlock woolly adelgid (Brad Onken, USDA Forest Service, Northeastern Area, Forest Health Protection, Morgantown, WV)

*NA-1998-02. Evaluating *Tomicus* movement through mill yards and potential effect of quarantine changes (James B. Hanson, USDA Forest Service, Northeastern Area, Forest Health Protection, St. Paul, MN)

—Patrice Janiga
USDA Forest Service

Forest Service-NAPIAP studies announced

Study proposals funded

Allan T. Bullard, Director of Enterprise Team-Morgantown and Acting Director of the Enterprise Team, recently announced the selection of study proposals to be funded under the Forest Service National Agricultural Pesticide Impact Assessment Program (FS-NAPIAP) for Fiscal Year (FY) 1998. FS-NAPIAP supports studies designed to fill data gaps and other critical missing information about benefits and impacts of using registered pesticides in forest and range management programs. It is part of an interagency USDA-NAPIAP effort.

An interdisciplinary team of agency and department experts considered 21 new proposals from Forest Service Regions, Stations, and Northeastern Area and recommended funding. (See the sidebar on this page for members of the Review Team.)

Seven new proposals and twelve continuing projects were approved for funding in FY 1998. Funded proposals are listed below, together with the name and telephone number of the principal investigator for the project.

For further information on the FS-NAPIAP program, contact: Allan Bullard, Director, Forest Health Technology Enterprise Team-Morgantown, 180 Canfield Street, Morgantown, WV 26505, 304-285-1563; or Gary K. Smith, Integrated Pest Management Specialist, 333 S.W. First Avenue, Portland, OR 97204, 503-808-2914.

FS-NAPIAP Studies, Fiscal Year 1998

Studies marked with an asterisk (*) are continuing projects.

*R4-19 Effects of tebuthiuron on biodiversity in sagebrush grassland (Mark Ritchie, Utah State University, 801-798-2437)

*R5-16 Residues of forestry herbicides in plants of interest to Native Americans (Randall Segawa, California Department of Pesticide Regulation, 916-324-4137)

R5-17 Efficacy and nontarget effects of hexazinone and tebuthiuron for control of nonnative plants in Hawai'i (Phil Motooka, University of Hawai'i, Kona, 808-324-0496)

*R6-15 Effects of seasonal picloram application on plant diversity (Richard Everett, USDA Forest Service, Pacific Northwest Experiment Station, 509-662-4315)

*R6-17 Protection of native plant communities at risk from yellow starthistle in the Siskiyou ecological province (Jeanette Williams, Rogue River National Forest, 541-899-1812)

R6-18 Assessing the potential of nontarget exposure to secondary poisoning poststrychnine baiting to reduce pocket gopher populations (Dale Nolte, USDA National Wildlife Research Center, 360-664-3441)

*R8-31 Dissipation of Arsenal™ and Oust™ in the Georgia coastal plain (Parshall Bush, University of Georgia, 706-542-9023)

*R8-33 Gypsy moth suppression tactics—comparative effects on arthropod biodiversity in Kentucky forests (Lynne Rieske-Kinney, University of Kentucky, 606-257-7457)

R8-38 Evaluation of sulfluramid, an alternative to methyl bromide, for control of the Texas leaf-cutting ant (Donald Grossman, Texas Forest Service, 409-639-8170)

*NA-62 Factors governing susceptibility of nontarget Lepidoptera to *Bacillus thuringiensis* var. kurstakii (William McCarthy, Pennsylvania State University, 814-863-4433)

NA-70 Glyphosate and sulfometuron methyl impacts on diversity of plants and wildlife in Allegheny hardwoods (Stephen Horsley, USDA Forest Service, Northeastern Experiment Station, 814-563-1040)

FPL-36 Evaluation of wood preservative efficacy and leaching in a wetland environment (Stan Lebow, USDA Forest Service Forest Products Laboratory, 608-231-9411)

*INT-24 Use of tebuthiuron to promote diversity in big sagebrush (E. Durant McArthur, USDA Forest Service Intermountain Experiment Station, 801-342-5140)

*INT-26 Structural complexity and bird/elk abundance in herbicide treated grasslands (Peter M. Rice, University of Montana, 406-243-2671)

PSW-33 Repeated use of glyphosate on functional diversity and key processes of nontarget soil organisms (Robert Powers, USDA Forest Service, Pacific Southwest Experiment Station, 530-246-5455)

*SO-38 Reducing movement of imazapyr to streams and impacts on aquatic diversity with different SMZ widths (Jerry Michael, USDA Forest Service, Southern Research Station, 334-826-8700)

*SO-40 Effectiveness of fumigation with metam-sodium for seedling production and pest management in southern pine nurseries (Stephen Fraedrich and David

See **FS-NAPIAP**, page 13

From **FS-NAPIAP**, page 12

Dwinnell, USDA Forest Service, Southern Research Station, 706-546-2455)

*SO-41 Movement of imazapyr from flatwoods forestry sites into wetlands, and impacts on wetland biota (Jerry Michael, USDA Forest Service, Southern Research Station, 334-826-8700)

SO-42 Effect of fumigation with chloropicrin and EPTAM, individually and in combination, on the management of pests and production of seedlings in southern forest tree nurseries (Stephen Fraedrich and David Dwinnell, USDA Forest Service, Southern Research Station, 706-546-2455)

—Gary K. Smith
USDA Forest Service

FS-NAPIAP Review Team

- Deb Hayes, USDA Forest Service, Washington Office, National Forest System-Range Management
- Nancy Ragsdale, Director, USDA NAPIAP
- Nancy Rappaport, USDA Forest Service Research, Pacific Southwest Station
- Leslie Rubin, USDA Animal and Plant Health Inspection Service (APHIS)
- Gary K. Smith, USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team
- Jack Stein, USDA Forest Service, Forest Health Protection, Forest Health Technology Enterprise Team
- Fred Zensen, USDA Forest Service, National Forest System, Forest Management

Steering Committee to meet

The Forest Health Technology Enterprise Team Steering Committee will meet in Fort Collins, Colorado, on May 20 and 21, 1998. The Steering Committee meets annually to provide general guidance and suggest course changes (e.g., opportunities the Team should be aware of and take advantage of) to us. It also provides a broad base of direction for the programs of the Team and helps identify enterprise opportunities for us to pursue. Steering Committee members represent a broad spectrum of partner, collaborator, and cooperator groups, including National Forest System, Research and Forest Health Protection units from within the Forest Service, the National Association of State Foresters, the National Plant Board, the Environmental Protection Agency, the Agricultural Research Service, the Animal and Plant Health Inspection Service, the environmental community, private industry, and academia.

In 1997 the Steering Committee recommended that we expand the Committee to include the USDA Agricultural Research Service (ARS), the environmental community, and private industry. As a result of that recommendation, Ernest Delfosse of ARS, Dr. Elizabeth Chornesky of the Nature Conservancy and R. Scott Cameron of the Union Camp Corporation have accepted invitations to join the Committee. Several other membership changes have occurred since 1997, with Jerry Boughton and Gerard Hertel replacing Dave Spores, and Bill Carothers and Pete Roussopoulos replacing Jim Space. We welcome all our new members!

—Allan T. Bullard
USDA Forest Service

Forest Health Technology Enterprise Team Steering Committee

Janet Anderson, U.S. Environmental Protection Agency

Jerry Boughton, USDA Forest Service, Alaska Region State and Private Forestry

R. Scott Cameron, Union Camp Corporation

Elizabeth Chornesky, Nature Conservancy

Ernest Delfosse, USDA Agricultural Research Service

Bill Dickerson, North Carolina Department of Agriculture

Greg Fitch, New Mexico Forestry Division

Wray Freemen, South Carolina Forestry Commission

Gerry Hertel, USDA Forest Service, Northeastern Area State and Private Forestry

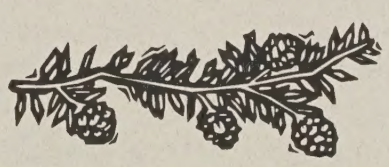
Michael Oraze, National Biological Control Institute

Christopher Risbrudt, USDA Forest Service, Director, Ecosystem Management

Pete Roussopoulos, USDA Forest Service, Director, Southern Research Station

Tom L. Thompson, USDA Forest Service, Rocky Mountain Region Regional Forester's Office

John Walstad, Oregon State University



USDA Forest Service

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Events of Interest

May 20-21, 1998. Fort Collins, CO
Forest Health Technology Enterprise Team Steering Committee Meeting
Contact: Allan T. Bullard, 304-285-1563

July 15-16, 1998. Orlando, FL
National Spray Model and Application Technology Working Group Meeting. Disney's Coronado Springs Resort
Contact: Harold Thistle, 406-329-3981 or Pat Skyler, 916-454-0817